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INSTRUCTION MANUAL

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131-38 SANFORD AVENUE • FLUSHING 52, N. Y.
Area Code 212 IN 1-7000 • TWX # NY 4-5196

INSTRUCTION MANUAL

BAC 525454
thru 525463

MODELS SM 36-15X
OR SM 36-15MX
Power Supply
SERIAL NO. .....

KEPCO, INC.
131 - 38 Sanford Avenue
Flushing 52, New York

Kepco, Inc.
Flushing, New York

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SECTION A SPECIFICATIONS AND CONTROLS FOR MODELS SM 36-15X AND SM 36-15MX

I. ELECTRICAL AND PHYSICAL SPECIFICATIONS:

.....DC OUTPUT VOLTAGE:
0-36 volts DC, continuously variable.

.....DC OUTPUT CURRENT:
0-15 amperes, continuous duty.

.....AC INPUT:
105-125 volts, 60± 1/2 cps, 10.5 amperes (max.), 1100 watts (max.).

.....REGULATION: (See "remote error sensing" under "II. Terminals and Controls.")
Line: Less than 0.01% for 105-125 volts AC line fluctuations at any output voltage in the specified range.
Load: Less than 0.01% or 0.001 volt, whichever is greater, for 0-15 ampere step load change, at any output voltage in the specified range.

.....RIPPLE:
Less than 0.001 volts rms.

.....STABILITY:
Output voltage variation is less than 0.01%. Over a period of 8 hours, after unit has reached equilibrium. Approximately 3/4 of an hour is required for this unit to reach equilibrium from a "cold start".

.....OUTPUT IMPEDANCE:
Less than .001 ohm from DC to 1 KC.
Less than .03 ohm from 1 KC to 100 KC.

.....RECOVERY TIME:
50 microseconds.
Recovery time is defined as the time required for the output voltage to return to within 0.1 volts of the output voltage setting.

.....TEMPERATURE COEFFICIENT:
Output voltage changes less than 0.01% per °C.

.....AMBIENT OPERATING TEMPERATURE:
-20°C to +50°C maximum. Protective circuit turns off unit whenever over-temperature condition occurs in pass elements. Interrupting input power resets unit.

.....STORAGE TEMPERATURE:
-40°C to +85°C.

.....DIMENSIONS:
8-3/4" high x 19" wide x 13-7/8" deep (behind panel).

.....COLOR:
Kepco Standard Gray Hammertone.

..... METERS: (APPLIES ONLY TO MODEL SM 36-15MX)
Voltmeter: 0-50 volts, 2-1/2".
Ammeter: 0-15 amps, 2-1/2".

II. TERMINALS AND CONTROLS:

.....(On front panel):

....DC OUTPUT AND GROUND binding posts, clearly marked. Output terminals isolated from chassis; either positive or negative terminal may be grounded.
....VOLTAGE CONTROL, continuously variable, for setting the desired output voltage.
....POWER ON-OFF switch.

.....(At rear of unit):
....DC OUTPUT AND GROUND binding posts, clearly marked; either positive or negative terminal may be grounded.
....REMOTE ERROR SENSING binding posts provide means of maintaining specified regulation directly at the load by compensating for voltage drop across load supply leads for up to 0.5 volt maximum per lead. (See Diagram and Procedure on Page C-1.)

III. PROTECTIVE FEATURES:

....REFERENCE FUSE for input to the auxiliary supplies. Pilot light goes out if fuse blows; fan stops.
....POWER FUSE for line power input. Pilot light goes out if fuse blows; fan stops.
....DC FUSE for main supply. Pilot light remains on if fuse blows; fan remains operative.

.....OVERLOAD PROTECTION:
Provided by inherent current limiting action of FLUX-O-TRAN. Output may be shorted momentarily without damage to unit. Continuous overload or short will blow DC FUSE.

.....OVER-TEMPERATURE PROTECTION:
Thermostat relay control turns unit off if temperature of pass elements exceeds safe limit. Relay is reset by interrupting input power with ON-OFF switch on front panel, or by disconnecting line cord from power source.

SECTION B

BRIEF THEORY:

Two circuit schematic drawings titled "POWER UNIT" and "CONTROL UNIT" are included in the Reference Index of this instruction manual. These drawings contain designations corresponding to the capitalized terms in the following discussion.

Some basic functional relationships in this power supply are illustrated in block Diagram B-1 (Page B-2A).

The POWER UNIT includes:

DC SOURCES:

....MAIN SUPPLY - (consisting of a Kepco "Flux-O-Tran" transformer, full wave bridge rectifier, and capacitive filter) provides line regulated DC power for the output, via the PASS CIRCUITRY.

....AUXILIARY SUPPLIES: COLLECTOR SUPPLY (negative full wave rectified) for PASS CIRCUITRY driver stages not connected to MAIN SUPPLY; I_{CO} SUPPLY (full wave rectified) compensates for spurious biasing effects of collector leakage current; RETURN SUPPLY (full wave rectified) acts as leakage current path for series pass transistors and as bleed path to provide minimum operating current for pass transistors; CONTROL UNIT SUPPLY (full wave rectified).

PASS CIRCUITRY:

The power transistors which function as pass elements (i.e. are in series with the load) may be regarded effectively as variable resistors (or conductors) controlled by a CONTROL SIGNAL. The current "passed" by these elements is a function of the emitter-base bias. The CONTROL SIGNAL is applied to the base terminal; hence a negative CONTROL SIGNAL will aid the forward conduction of a PNP transistor while a positive CONTROL SIGNAL will reduce the forward conduction. In response to the CONTROL SIGNAL the pass elements effect a current and voltage distribution in the main DC loop which holds the output voltage constant.

The CONTROL UNIT includes:

REFERENCE CIRCUITRY:

The function of the REFERENCE CIRCUITRY is to maintain a precise, stable, voltage standard for the COMPARISON AMPLIFIER.

COMPARISON AMPLIFIER:

The COMPARISON AMPLIFIER is essentially a series of cascaded transistor amplifiers which boost the differential error signal produced in the COMPARISON BRIDGE to a level sufficient to drive the PASS CIRCUITRY. The COMPARISON AMPLIFIER is connected across the COMPARISON BRIDGE from the junction of the VOLTAGE CONTROL and the REFERENCE RESISTANCE to the junction of the REFERENCE DIODE and the negative output terminal (See Diagram on Page B-2A). This arrangement is similar to that of a null galvanometer across a Wheatstone bridge. Unbalance in the COMPARISON BRIDGE is amplified to produce a CONTROL SIGNAL of suitable magnitude and phase to effect corrective action by the PASS CIRCUITRY.

COMPARISON BRIDGE: (See Diagram B-2, Page B-2A).

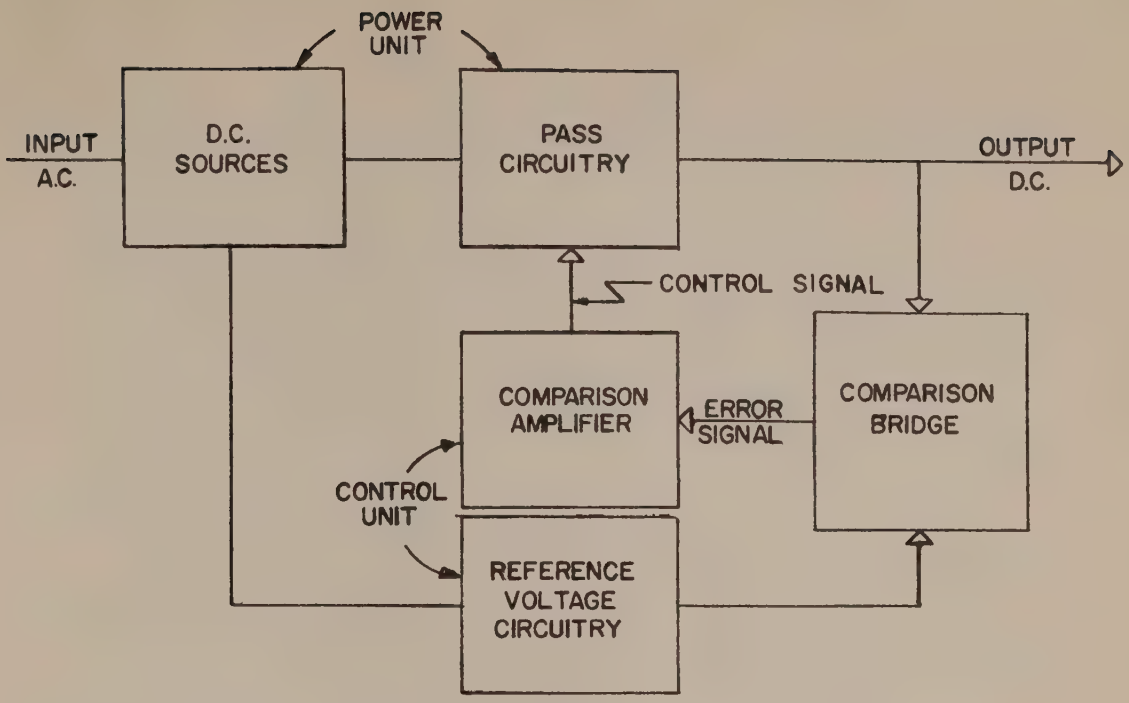
This bridge circuit implements the comparison between the OUTPUT VOLTAGE and the REFERENCE VOLTAGE. The signal produced by the comparison drives the COMPARISON AMPLIFIER.

Balance occurs in the Comparison Bridge when the following ratios are equal:

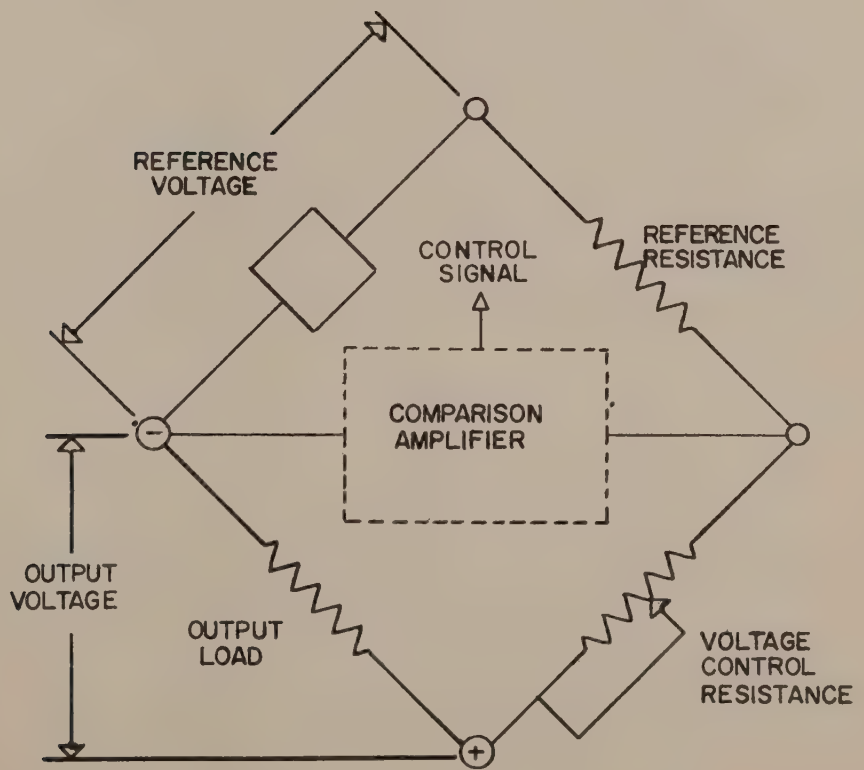
$$\frac{\text{Output Voltage}}{\text{Voltage Control Resistance}} = \frac{\text{Reference Voltage}}{\text{Reference Resistance}}$$

When, for example, the Comparison Bridge is unbalance by a decreasing output voltage drop across the load, it gives rise to a negative signal at the base of the COMPARISON FOLLOWER in the COMPARISON AMPLIFIER circuit. This signal is amplified in cascade and communicated to the pass elements as a negative base input aiding their forward conduction and consequently increasing the output voltage.

A bridge unbalance caused by an increasing output voltage produces, of course, a chain of oppositely biased circuit responses which reduce the voltage across the load.



(DIAGRAM B-1) *VOLTAGE REGULATED POWER SUPPLY*



(DIAGRAM B-2) *COMPARISON BRIDGE*

This power supply is shipped without any internal packing material; and may be put into operation immediately. It is designed for rack and for bench use. Carrying handles are provided on front panel.

....INTIAL "TURN - ON" PROCEDURE:

1. Adjust VOLTAGE CONTROL to approximate mid-range position.
2. With POWER ON-OFF switch set in "OFF" position, connect line cord to 115 v ac, 60 cps input power. If outlet is not polarized use 3 to 2 - prong adapter supplied with unit.
3. Set POWER ON-OFF switch to "ON" position.
4. Adjust VOLTAGE CONTROL to obtain desired output voltage.

....GENERAL OPERATION:

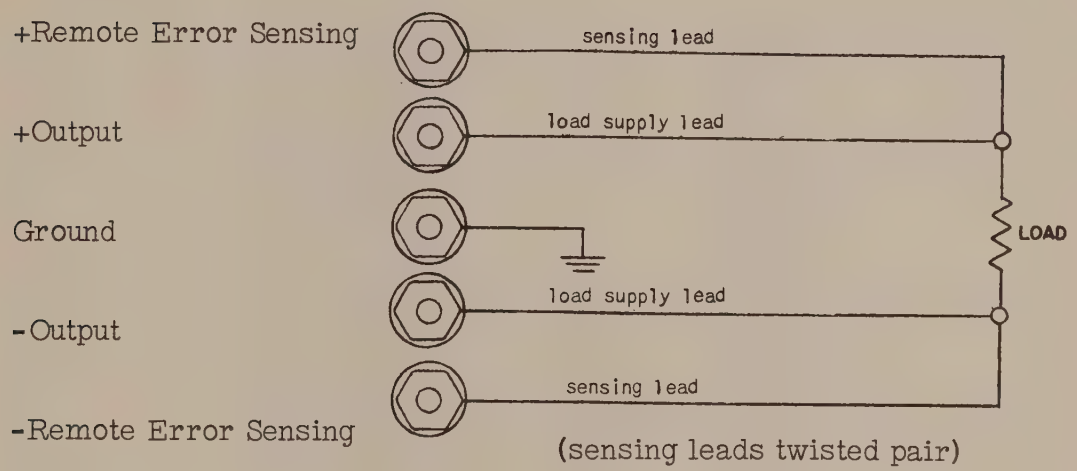
1. Once it has been determined that the unit is functioning satisfactorily, it is subsequently unnecessary to follow the INITIAL TURN-ON PROCEDURE.
2. The VOLTAGE CONTROL may be left fixed at any setting and the power turned "ON" and "OFF" without any harmful effects.

....MAINTENANCE AND REPAIR:

1. Under normal operating conditions, no mechanical maintenance of any kind should be required. Conservatively rated electrical components assure long trouble-free operating life.
2. Exceptional component accessibility, provided by resistor board construction and plug-in sub-assemblies, facilitates servicing, should it be required. It is emphatically recommended that trouble-shooting be handled by personnel highly familiar with transistor circuitry, - preferably with experience in closed-loop designs.
3. This unit should not be returned to the manufacturer without proper authorization and shipping instructions. In any correspondence with the factory regarding repair, the model, serial number, and symptoms of malfunction must be included.

REMOTE ERROR SENSING OPERATION

(Terminal Connections)



(Procedure)

1. With AC input power disconnected, remove jumpers between plus and minus Output terminals and Remote Error Sensing terminals on the rear of the unit.

2. Using twisted pair wire, connect sensing leads from positive and negative Remote Error Sensing terminals to the load (observing polarities).

3. Using twisted pair wire, connect load supply leads from positive and negative Output terminals.

IMPORTANT NOTE: This unit should not be operated with Remote Error Sensing if the voltage drop across the load supply leads exceeds 0.5 volt (maximum) per lead at maximum rated output current.

kepco inc. ® REPLACEMENT PARTS LIST

SCHEMATIC NO.	QTY.	DESCRIPTION	MFRS. NAME & PART NO. (See Note)	KEPCO PART NO.
B201	1	Fan Venturi	Rotron	149-0013
C201	1	Capacitor, Electrol, Can 21 K µf, 57.5 V	Sangamo DCM	117-0294
C202	1	Capacitor, Electrol, Can 10.5 µf, 65 V	Industrial Cond. 1B1211	117-0242
C203	1	(Same as C202)		
C204	1	Capacitor, Paper, Can 8 µf, 660 VAC	Industrial Cond. 2465-SVR	117-0280
C206	1	Capacitor, Mylar 2 µf, 200 V	Hopkins 2P2M	117-0129
C207	1	Capacitor, Mylar 0.1 µf, 600 V	Good-All Elec. 620S10406W	117-0068
C301	1	Capacitor, Ceramic 0.05 µf, 500 V	Sprague 36C142A1	117-0163
C302	1	Capacitor, Electrol, Pigtail 10 µf, 150 V	Industrial Cond. 10B912RM	117-0147
C303	1	Capacitor, Electrol, Pigtail 350 µf, 50 V	Industrial Cond. 1B844	117-0114
C401	1	Capacitor, Electrol, Pigtail 350 µf, 50 V	Industrial Cond. 1B844	117-0114
C402	1	Capacitor, Electrol, Pigtail 100 µf, 200 V	Industrial Cond. 20B317RM	117-0222
C403	1	Capacitor, Electrol, Pigtail 500 µf, 50 V	Industrial Cond. 1B1163RM	117-0221
C404	1	(Same as C403)		
C405	1	Capacitor, Ceramic 0.05 µf, 500 V	Sprague 36C142A1	117-0163
C406	1	(Same as C405)		
CR201	1	Rectifier, Silicon,Stack	Kepco Inc. 124-0132	124-0132
CR301	1	Rectifier,Silicon, Pigtail	Automatic PT-5	124-0028
CR401	1	Rectifier,Silicon, Pigtail	Columbus CEC-105	124-0133
CR402	1	(Same as CR401)		

REPLACEMENT PARTS MAY BE ORDERED FROM KEPCO, INC. ORDERS SHOULD INCLUDE KEPCO PART NUMBER AND DESCRIPTION.

PLEASE NOTE: THE MANUFACTURER'S NAME AND PART NUMBER LISTED FOR EACH ITEM ON REPLACEMENT PARTS LISTS, REPRESENTS AT LEAST ONE SOURCE FOR THAT ITEM AND IS LISTED SOLELY FOR THE CONVENIENCE OF KEPCO EQUIPMENT OWNERS IN OBTAINING REPLACEMENT PARTS LOCALLY. WE RESERVE THE RIGHT TO USE EQUIVALENT ITEMS FROM ALTERNATE SOURCES. KEPCO, INC.

SCHEMATIC NO.	QTY.	DESCRIPTION	MFRS. NAME & PART NO. (See Note)	KEPCO PART NO.
CR403	1	Rectifier,Silicon,Pigtail	Automatic PT-5	124-0028
CR404	1	(Same as CR403)		
CR405-408	4	(Same as CR401)		
F101	1	Fuse, Instantaneous	Bussman ABC-15	141-0010
F102	1	Fuse,Slow Blow	Bussman MDL-20	141-0038
F401	1	Fuse, Instantaneous	Bussman ABC-10	141-0012
M101	1	Meter 50 VDC, 2½"	General Elec. 8DW91V201AR2	135-0138
M102	1	Meter 15 ADC 2½"	General Elec. 91A230BX2	135-0141
PL101	1	Pilot Light	General Elec. NE-51	153-0024
Q301	1	Transistor,PNP	Tung-Sol 2N382	119-0022
Q302	1	Transistor, PNP	Delco 2N1172	119-0034
R201	1	Resistor,Fixed,Power Strip 1K ohm, 40 W	Ward Leonard 40S1000	115-0513
R202	1	Resistor,Fixed,Power Strip 1 ohm, 20W	Ward Leonard 40S2000	115-0690
R203	1	Resistor,Fixed,Power Strip 15 ohm, 30 W	Hardwick Hindle B5521	115-1173
R204	1	Resistor,Fixed,Power,Strip 500 ohm, 20 W	Ward Leonard 20S500	115-0551
R205	1	Resistor,Fixed,Power Strip 150 ohm, 20 W	Ward Leonard 20S150WL	115-0577
R206-208	3	Resistor,Fixed,Power Ribbon 0.1 ohm, 40 W	Hardwick Hindle 2B3501	115-1014
R209	1	Resistor,Variable Wire Wd. 5 K ohm, 2.5 W	General Radio 973-M	115-0896
R210	1	Resistor,Fixed,Molded 50 ohm, 3 W	Ward Leonard 3X50	115-0641

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SCHEMATIC NO.	QTY.	DESCRIPTION	MFRS. NAME & PART NO. (See Note)	KEPCO PART NO.
R211	1	(Same as R210)		
R212	1	Resistor,Fixed,Molded 33 ohm, ½ W	Allen Bradley EB3301	115-0681
R213	1	Resistor,Fixed,Molded 10 ohm, ½ W	Allen Bradley EB1001	115-0502
R301	1	Resistor,Fixed,Power Axial 10 ohm, 3W	Ward Leonard 3X10	115-0421
R302	1	Resistor,Fixed,Molded 68 ohm, ½ W	Allen Bradley 5X200	115-0904
R303	1	Resistor,Fixed,Molded 3.9 K ohm, ½ W	Allen Bradley EB3925	115-0808
R304	1	Resistor,Fixed,Molded 1.2 K ohm, 1 W	Allen Bradley GB1225	115-0900
R305	1	Resistor,Fixed,Power Axial 200 ohm, 5 W	Ward Leonard 5X200	115-0905
R306	1	Resistor,Fixed,Molded 100 ohm, ½ W	Allen Bradley EB1015	115-0341
R307	1	Resistor,Fixed,Molded 330 K ohm, ½ W	Allen Bradley EB5631	115-0250
R308	1	Resistor,Fixed,Power Axial 1K ohm, 5 W	Ward Leonard 5X1000	115-0512
R309	1	Resistor,Fixed, Molded 100 K ohm, ½ W	Allen Bradley EB1041	115-0809
R320	1	Resistor,Fixed,Axial 2.5 K, 3 W	Ward Leonard 3X2500	115-0469
RL201	1	Relay,Plug In Type	Kurman 26 D3C	140-0040
S101	1	Switch,Toggle SPST	Carling AA252-71-2	127-0107
T201	1	Transformer,Flux-O-Tran	Kepco Magnetics 100-1180	100-1180
T202	1	Transformer,Variable	Kepco Magnetics 175-0294	175-0294
T401	1	Transformer	Kepco Magnetics 100-1179B	100-1179B

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SCHEMATIC NO.	QTY.	DESCRIPTION	MFRS. NAME & PART NO. (See Note)	KEPCO PART NO.
Transistor Assembly:				
A901	1	Pass Transistor Assembly AO/441-10	Kepco Magnetics	110-0114
		Includes the following:		
	1ea.	Transistor, PNP	Delco 2N441-10	119-0016
A902	1	Pass Transistor Assembly 2CO.2/SP67	Kepco Magnetics	110-0118
		Includes the following:		
	2ea.	Resistor,Fixed,Power Axial 0.2 ohm, 5 W	Ward Leonard 7/8"-Y-0.2	115-0891
	2ea.	Transistor, PNP	Motorola SP67	119-0035
A903	1	Pass Transistor Assembly 2CO.2TC/SP67	Kepco Magnetics	110-0120
		Includes the following:		
	2ea.	Resistor,Fixed,Power Axial 0.2 ohm, 5 W	Ward Leonard 7/8"-Y-0.2	115-0891
	1ea.	Switch,Thermostat N.C.	Chatham DRSCORP73C	127-0093
	2ea.	Transistor, PNP	Motorola SP67	119-0035

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REPLACEMENT PARTS LIST

Control Unit, Model TRAM 31

SCHEMATIC NO.	QTY.	DESCRIPTION	MFRS. NAME & PART NO. (See Note)	KEPCO PART NO.
C1	1	Capacitor, Electrolytic 10 µf, 50v; Pigtail	Industrial 05RM10	117-0136
C2	1	Capacitor, Mylar 2 µf, 200v	Hopkins 2P2M	117-0129
C3	1	Capacitor, Mylar 0.5 µf, 200v	Hopkins	117-0123
CR1,2	2	Rectifier, Silicon, Pigtail 500 ma, 100 PIV	Transitron SL-91	124-0084
L1	1	Choke, RF 550 microhenry	Miller 4649	176-0046
Q1	1	Transistor, PNP Equal to 2N1172	Delco 119-0034	119-0034
Q2-6; 8,10	7	Transistor, PNP Equal to 2N382	Tung-Sol 119-0022	119-0022
Q7,9	2	Transistor,NPN	General Transistor 119-0007	119-0007
R1,5	2	Resistor, Fixed, Molded 3.3 K ohms, 1/2w; 5%	Allen Bradley EB3325	115-0452
R2, 14	2	Resistor, Fixed, Molded 2.7 K ohms, 1/2w; 10%	Allen Bradley EB2721	115-0560
R3,4	2	Resistor, Fixed, Precision 500 ohms, 1w; 1%	Sage Electronics SAIW	115-1192
R6,7	2	Resistor, Fixed, Molded 6.8 K ohms, 1/2w; 5%	Allen Bradley EB6825	115-0579
R8	1	Resistor, Fixed, Precision 15K, 1/2w; 1%	Dale WS 1/2	115-0646
R9	1	Resistor, Power, Axial, WW 10 K ohm, 3w; 5%,LTC	Hardwick Hindle 9/16 GA	115-1162
R10	1	Resistor, Power, Axial 2.5 K ohms, 3w; 5%, WW	Ward Leonard 3X2500	115-0469
R11	1	Resistor, Fixed, Precision 400 ohms, 1w; 1%	Sage Electronics SAIW	115-1191

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SCHEMATIC NO.	QTY.	DESCRIPTION	MFRS. NAME & PART NO. (See Note)	KEPCO PART NO.
R12 *Note 1	*	Resistor, Fixed, Precision 800 ohms, 1/2w; 1%	Sage Electronics 1050S	115-1193
R12 *Note 2	*	Resistor, Fixed, Precision 700 ohms, 1/2w; 1%	Sage Electronics 1050S	115-1194
R12 *Note 3	*	Resistor, Fixed, Precision 900 ohms, 1/2w; 1%	Sage Electronics 1050S	115-1195
R13	1	Resistor, Power, Axial 500 ohms, 3w; 5%, LTC	Ward Leonard 3X500 LTC	115-0938
R15	1	Resistor, Fixed, Molded 20 ohms, 1/2w; 5%	Allen Bradley EB2005	115-0508
R16	1	Resistor, Fixed, Molded 160 K ohms, 1/2w; 5%	Allen Bradley EB1645	115-1024
R17	1	Resistor, Fixed, Molded 10 K ohm, 1/2w; 5%	Allen Bradley EB1035	115-0249
R18	1	Resistor, Fixed, Molded 300 ohms, 1/2w; 5%	Allen Bradley EB3015	115-0783
R19	1	Resistor, Power, Axial, WW 250 ohms, 3w; 5%, LTC	Hardwick Hindle 9/16 GA	115-1161
R20,24	2	Resistor, Power, Axial, WW 10 ohms, 3w; 5%, LTC	Hardwick Hindle 9/16 GA	115-1160
R21	1	Resistor, Fixed, Molded 100 ohms, 1w; 5%	Allen Bradley GB1015	115-0902
R22	1	Resistor, Variable, Multiturn 200 ohms, 1/4 w; 10%,25 t	Bourns Labs Trimit 271-1-201	115-0863
R23	1	Resistor, Fixed, Molded 180 ohms, 1/2w; 5%	Allen Bradley EB1815	115-0807
R25	1	Resistor, Fixed, Molded 10 ohms, 1/2w; 10%	Allen Bradley EB1001	115-0818
RD1	1	Reference Diode Zener, 6.2v, 10 ma	Hoffman IN429	121-0001

*Note 1- R12 is 800 ohms, Part no. 115-1193 in following Models:
SM 14-7X; SM 14-15X; SM 14-30X; SM 36-5X; SM 36-10X; SM 36-15X

*Note 2- R12 is 700 ohms, Part no. 115-1194 in following Models:
SM 75-2X; SM 75-5X; SM 75-8X; SM 160-1X; SM 160-2X; SM 160-4X

*Note 3 - R12 is 900 ohms, Part no. 115-1195 in following Models:
SM 325-0.5X; SM 325-1X; SM 325-2X

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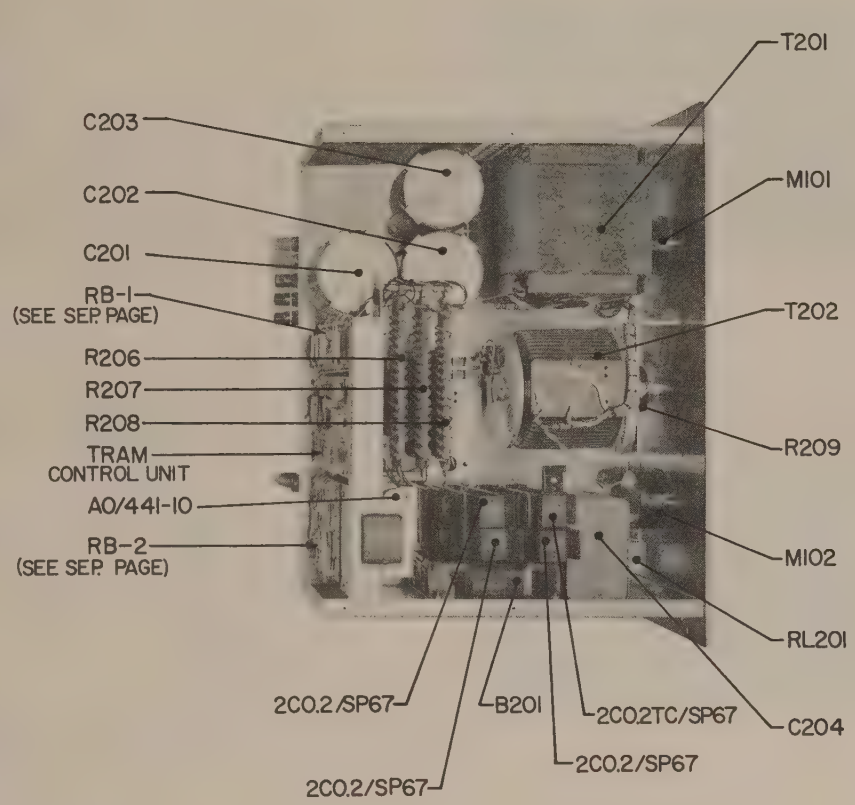
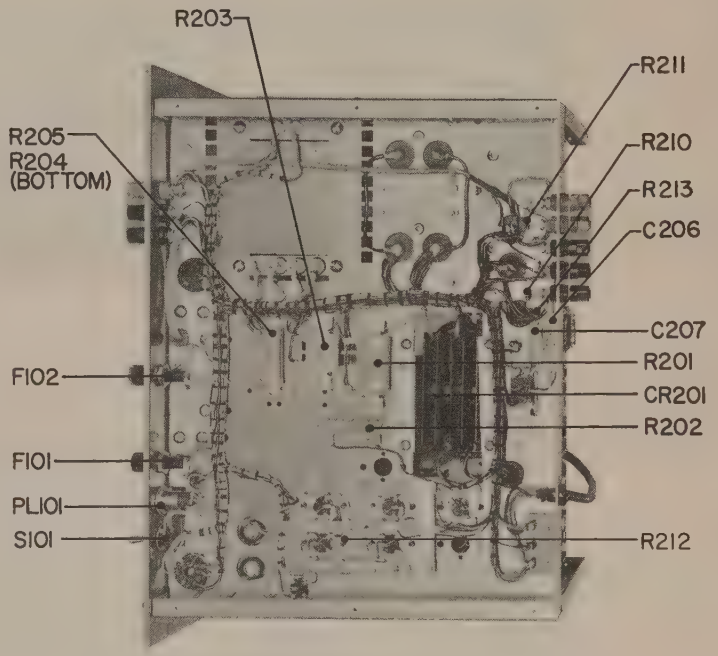
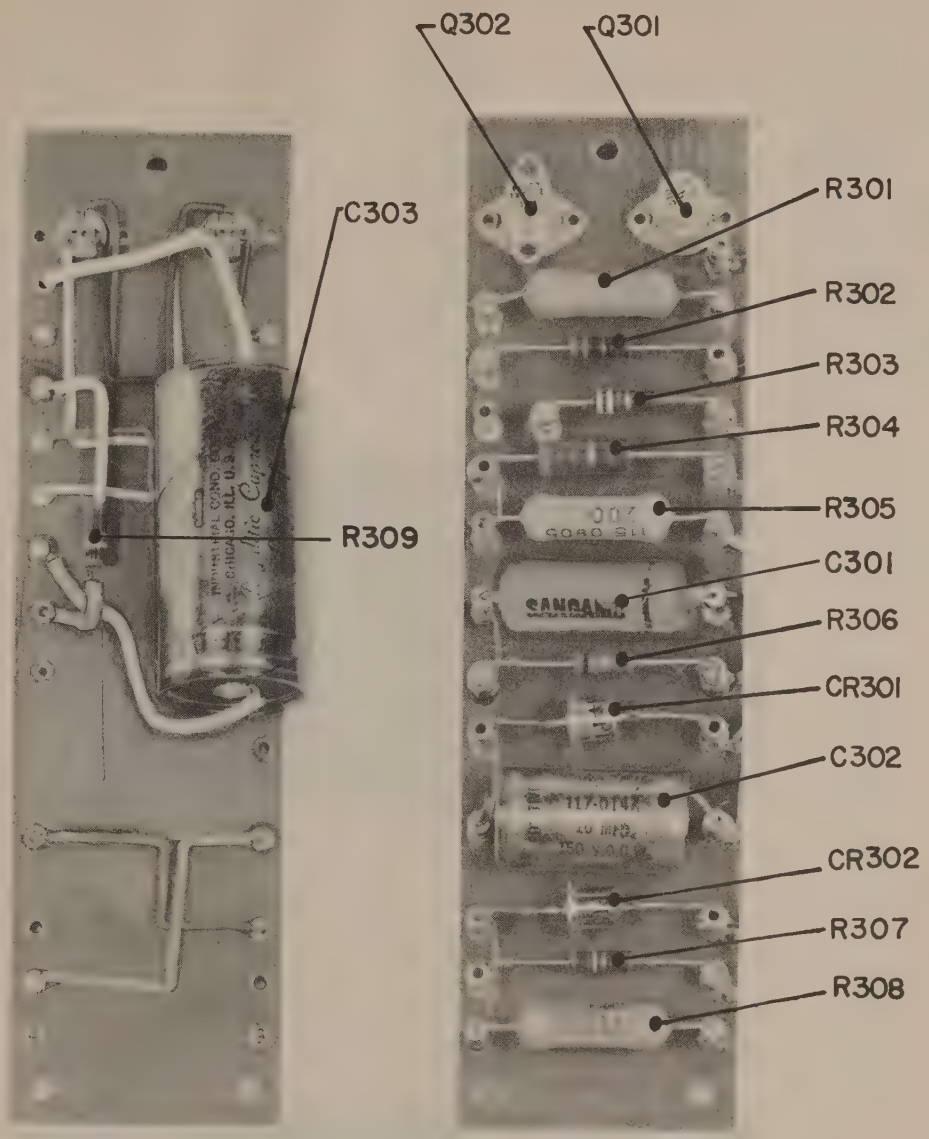




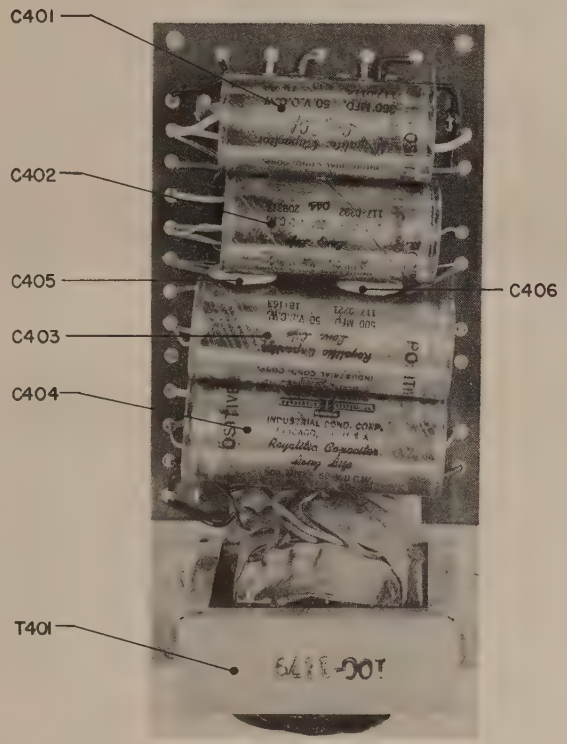
CORRECTIONS, IF ANY, APPEAR ON SHEET ATTACHED TO REAR COVER

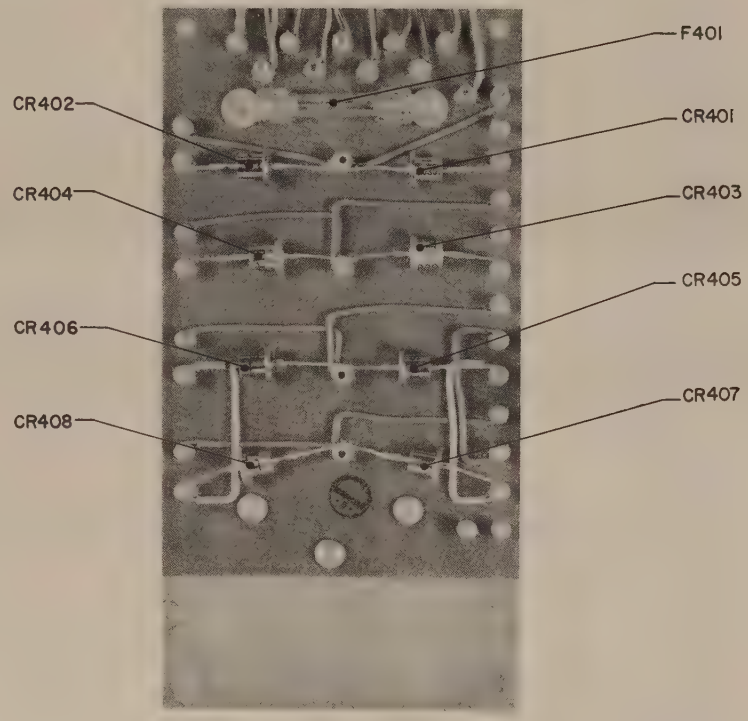
KEPCO INC.	
FLUSHING NEW YORK	
ITEM POWER UNIT	DES. 6-16-61
	APPD J.P.K.
MODEL SM-36-15	DFTM M.CEA
DWG. No CM00927	CHKD T. Dal



KEPCO INC.	
FLUSHING NEW YORK	
ITEM RB-1	DES. 6-16-61
	APPD J. Byrnes
MODEL SM-36-15	DFTM M. CEA
DWG. No. AM00910	CHKD

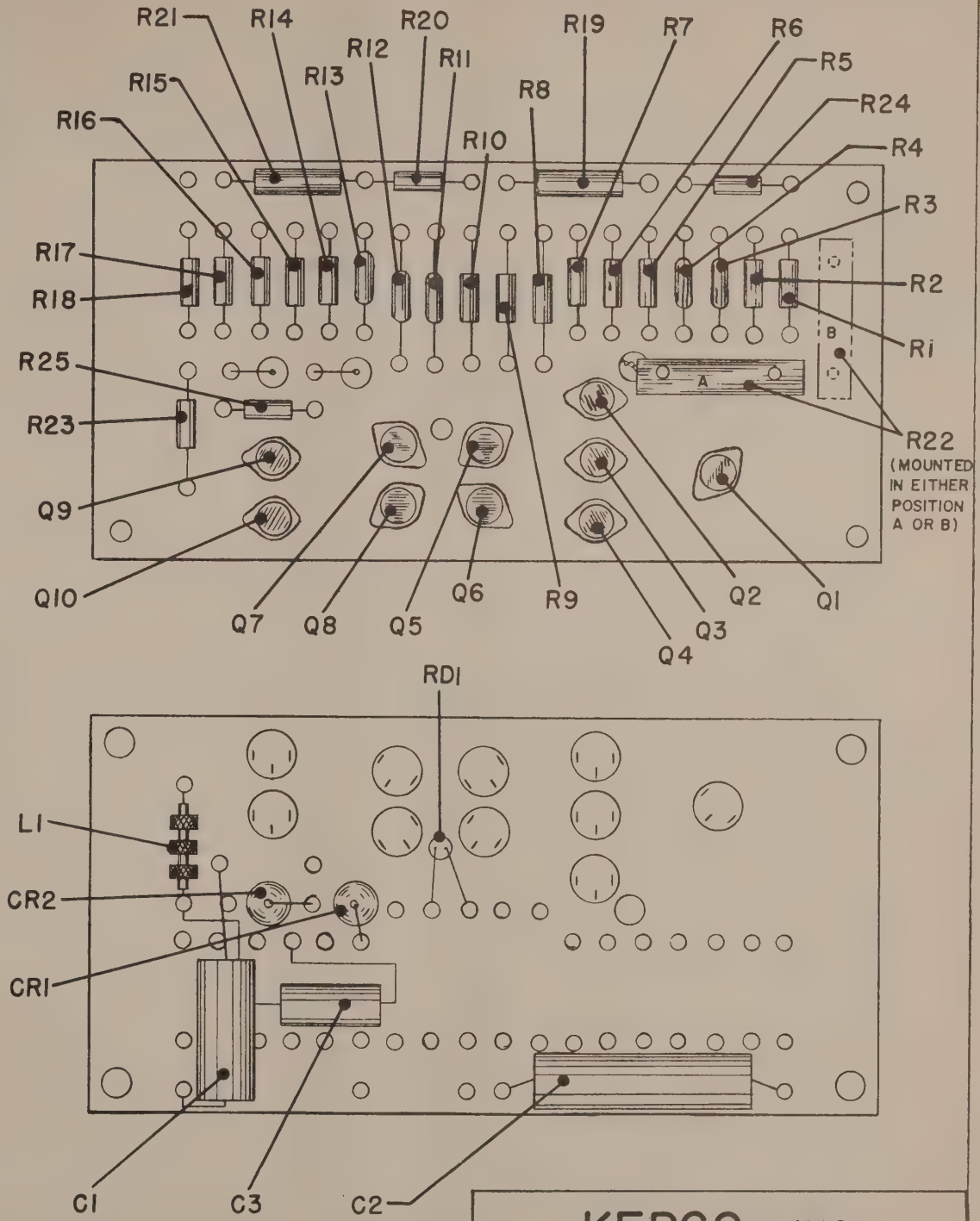
CORRECTIONS, IF ANY, APPEAR ON SHEET ATTACHED TO REAR COVER



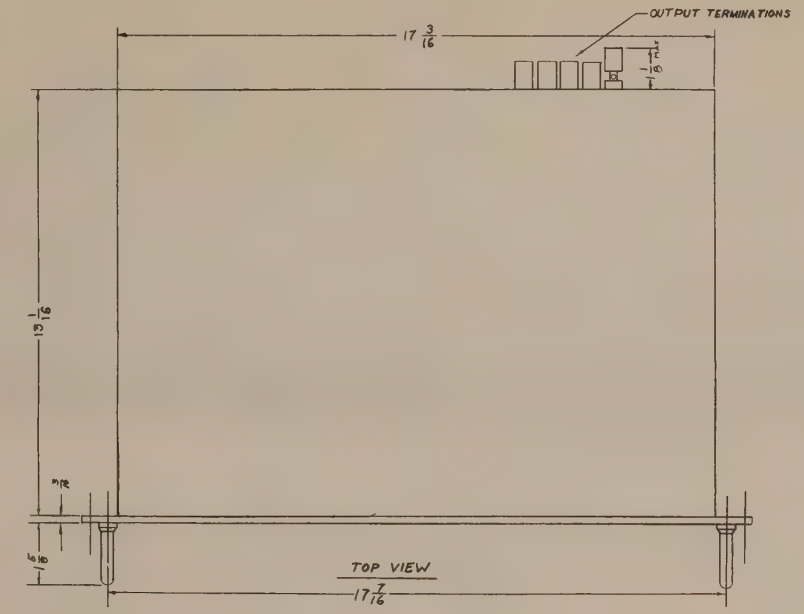


CORRECTIONS, IF ANY, APPEAR ON SHEET ATTACHED TO REAR COVER

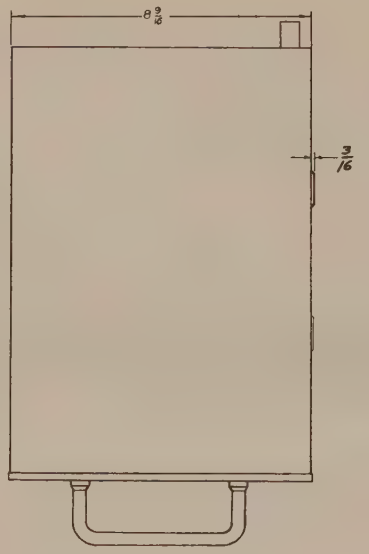
KEPCO INC.	
FLUSHING	NEW YORK
ITEM R8-2	DES. 1-3-61
	APPD
MODEL SM—— SERIES	DFTM M.CEA
DWG. No. BM00923	CHKD



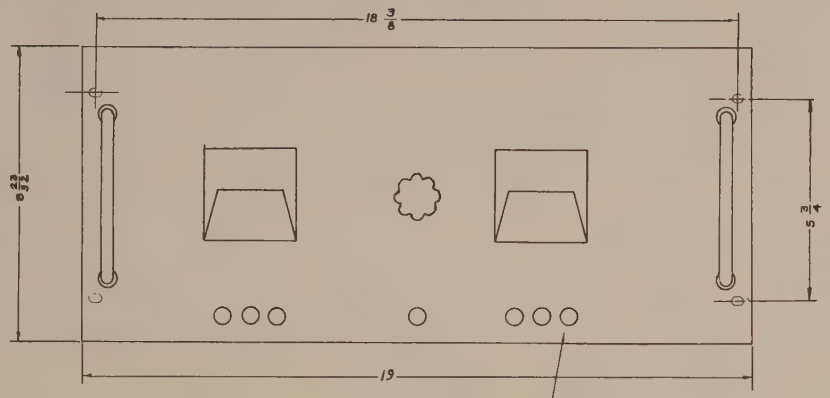
KEPCO INC.	
FLUSHING NEW YORK	
ITEM: CONTROL UNIT	DES. 12-6-61
	APPD
MODEL TRAM 31	DFTM M. RAYNER
DWG. No AM01809	CHKD



TOP VIEW



SIDE VIEW



FRONT VIEW

NOTE:
USED ON MODELS:

SM-36-15
SM-75-8
SM-160-4
SM 325-2

KEPCO INC. FLUSHING, N.Y.			
TITLE: OUTLINE DRAWING			
DRAWN: TV	CHECKED: TK	APPROVED: J. Kepp	DATE: 4-1-60
MODEL NO.: SM-8-3/4 SERIES		PART NO.:	SCALE: HALF
DWG. NO.: C M00593			2

TOLERANCE UNLESS OTHERWISE SPECIFIED FRACTIONS ± 1/64 DECIMALS ± .005 ANGLES ± 1/2°

INPUT CONTROL

DC SOURCES

PASS CIRCUITRY

OUTPUT

R203 5

T202 DC. FUSE F102 20 A SB

C204 8

RL 201

2C0.2TC / SP67

C302 10

INPUT RELAY

R307 330K

CR 302 PT5

R308 1K

CR 301 PT5

RELAY ENERGIZING CKT.

PL101

T201 100-1180 FLUX-O-TRAN

MAIN SUPPLY

CR201

-21

R208 0.1

R207 0.1

R206 0.1

R204 500

R202 1

2 X C202 10.5K + C203

PASS ASS'Y 2C0.2/SP67 (3 IN PARALLEL)

SP67 0.2

R212 33

-0.1

PASS ASS'Y 2C0.2TC/SP67

DRIVER ASS'Y A0/441-10

2N441

R305 200

R301 10

Q302 2N1172

R304 1.2K

-0.25

R302 68

Q301 2N382

R303 3.9K

-0.4

R309 100K

R306 100

C301 0-05

-0.53

CONTROL SIGNAL

M102 (FRONT) -DC

R210 47

(REAR)

OUTPUT CAP

R205 150

C201 21K

-ERROR SENSING

-OUTPUT

GND

+OUTPUT

+ERROR SENSING

R211 47

C303 350

M101

+36

+DC

C207 0.1

R213 10

VOLTAGE CONTROL

R209 5K

C206 2-0

AUXILIARY SUPPLIES

C405 0.05

C406 0.05

CR 404 PT5

CR 403 PT5

CR 408 SL-91

CR 406 SL-91

CR 405 SL-91

CR 407 SL-91

CR 401 SL-91

CR 402 SL-91

B201

RETURN SUPPLY

C402 100

+117

COLLECTOR SUPPLY

-17

C404 500

C403 500

+15

-16.8

C401 350

+14

CONTROL UNIT SUPPLY

T401 100-1179B

R201 1K

I_CO SUPPLY

F401 REF. FUSE 2A

S101 POWER ON-OFF

F101 POWER FUSE 15A

S201

CONTROL UNIT CONNECTOR

NOTE:

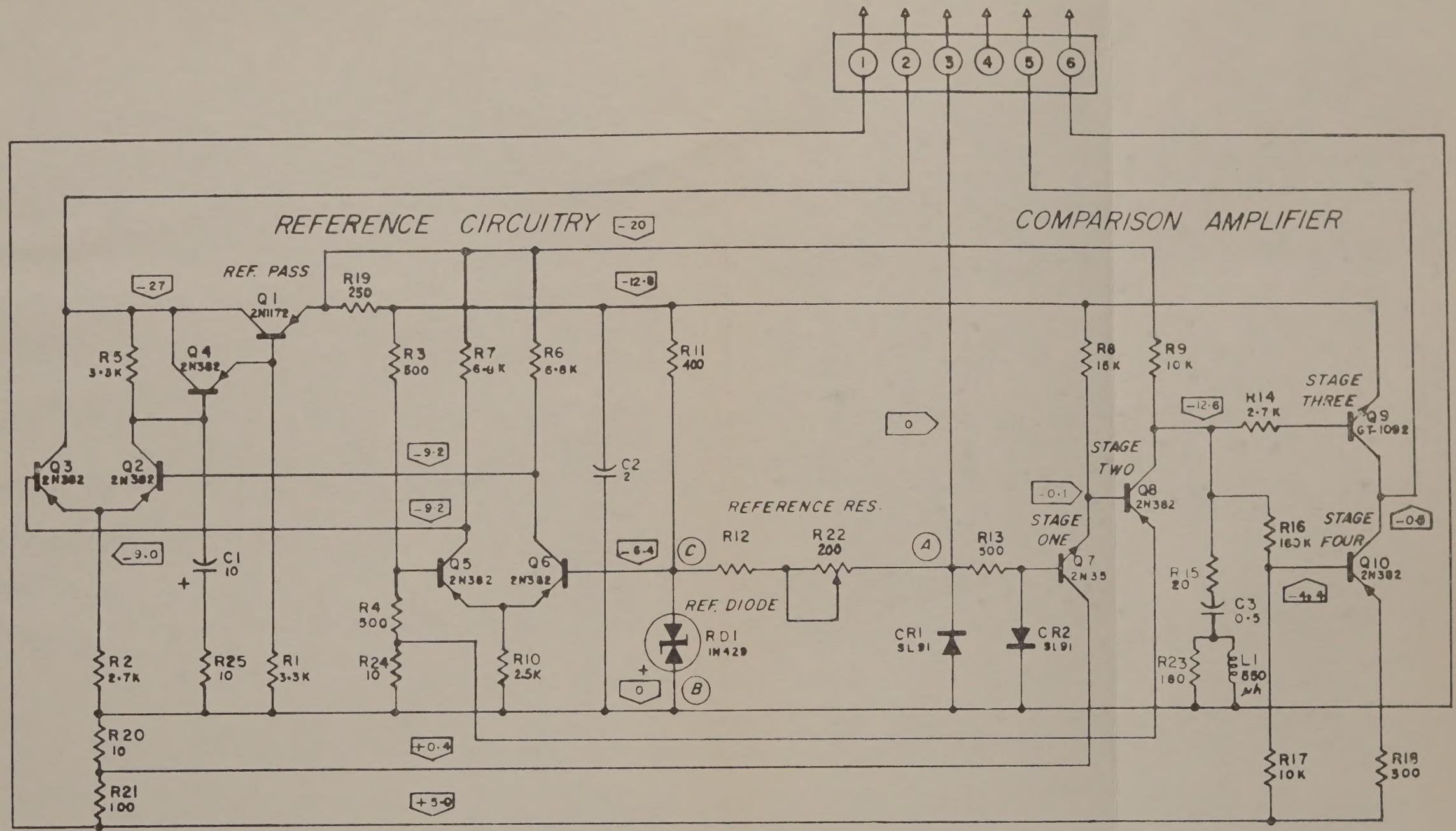
1. T202 GANGED TO R209.
2. ALL CAPACITOR VALUES ARE GIVEN IN MICROFARADS, RESISTOR VALUES IN OHMS, K=1000.
3. ALL VOLTAGE READINGS TAKEN WITH 20,000 Ω/VOLT METER, WITH REFERENCE TO MINUS OUTPUT TERMINALS, UNDER THE FOLLOWING CONDITIONS:
   A. LINE = 115 V.A.C.
   B. D.C. OUTPUT = 36 VOLTS.
   C. OUTPUT CURRENT = ZERO.
4. VOLTAGES ARE TYPICAL AND ARE SUBJECT TO NORMAL COMPONENT TOLERANCE.
5. METERS M101, M102 APPLY ONLY TO SM-36 -15 M AND SM-36 -.15MX MODELS.
6. ORDER REPLACEMENT PARTS BY KEPCO PART NUMBER PROVIDED IN PARTS LIST SECTION.

CONTROL UNIT CONNECTOR SOCKET (WIRING SIDE)

See Correction Sheet On Inside Back Cover.

KEPCO LABORATORIES
FLUSHING NEW YORK

ITEM POWER UNIT	DES J.R.G.
	APPD 10-24-61
MODEL SM-36-15M	DFTM J.O.K.
DWG. No C-M00293	CHKD J.P.K.



NOTE:

1. ALL VOLTAGES TAKEN UNDER CONDITIONS SPECIFIED ON MAIN SCHEMATIC.
2. ORDER REPLACEMENT PARTS BY KEPCO PART NUMBER PROVIDED IN PARTS LISTS SECTION.

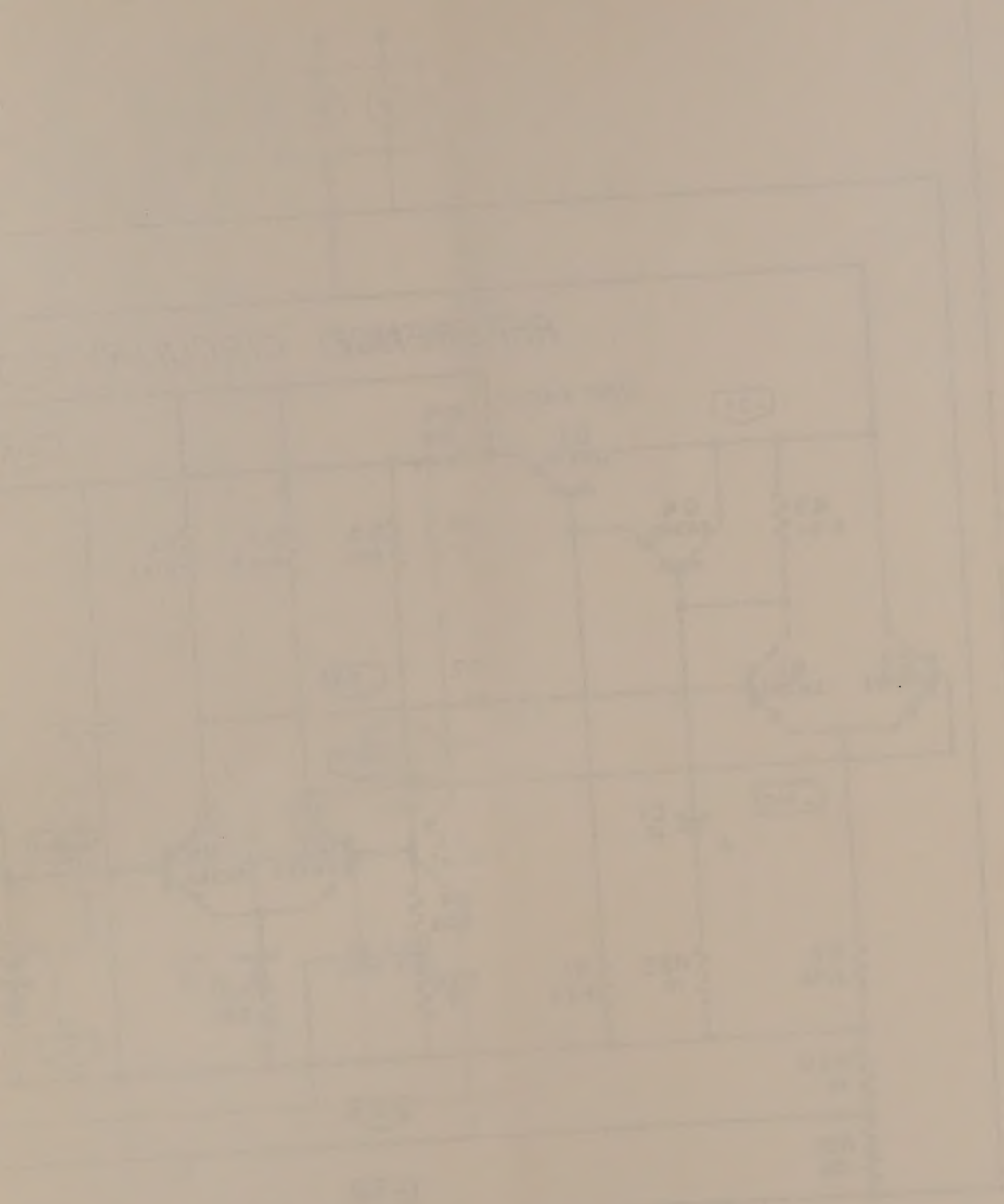
(*) MODELS: SM14-7X; SM14-15X; SM14-30X; SM36-10X; SM36-5X; SM36-15X

(**) MODELS: SM75-2X; SM75-5X; SM75-8X; SM160-2X; SM160-1X; SM160-4X; SM325-0.5X

(***) MODELS: SM325-1X; SM325-2X

KEPCO INC.
FLUSHING, N.Y.

TITLE: CONTROL UNIT			
DRAWN: C. A.	CHECKED: P.K.	APPROVED: A. Rosenstein	DATE: 4-20-62
MODEL NO.: TRAM - 31		PART NO.	SCALE
DWG. NO.: B M00629			4



INSTRUCTION MANUAL CORRECTION

Please note the following changes to the Manual material as indicated:

Power Unit, Schematic Diagram and Parts List:

1. (c513)Change Resistor R203 from 5 ohms, 30 w, to: Resistor, Fixed, Power, Strip, 15 ohms, 30 w; Hardwick Hindle B552; Kepco #115-1173.

INSTRUCTION MANUAL CORRECTION

Please note the following changes to the Manual material as indicated:

Power Unit, Parts List and Schematic:

1. The two resistors, 47 ohms, 1/2 watt each, connected one from each Output terminal to its respective Error Sensing terminal, have been changed to: Resistor, Fixed, Power, Axial, 50 ohms, 3 w, 5%; Ward Leonard 3X50; Kepco #115-0641.

2. Silicon Diode CR 302 (PT-5) has been replaced by a resistor R 320; Resistor, Fixed, Axial, 2500 ohms, 3 w, 5%; Kepco #115-0469; Ward Leonard #3X2500.

SM/7-1862 rev.

Model SM36-15M(r11)/3-1362
Model SM36-15MX(r5)/3-1362

131-38 SANFORD AVENUE • FLUSHING 52, N. Y. • Area Code 212 IN 1-7000 • TWX # NY 4-5196

146-0045 - 1/62 -12M